COMMONWEALTH OF KENTUCKY

BEFORE THE ENERGY REGULATORY COMMISSION

* * * * *

In the Matter of:

EAST KENTUCKY POWER COOPERATIVE, INC., AND BIG RIVERS ELECTRIC CORPORATION	)))	ADM. CASE NO. 238

O R D E R

The Commission in accordance with the provisions of KRS 278.040 and upon its own motion, finds that it is prudent and desirable for electric generating and transmission utilities to have emergency procedures available for implementation prior to the onset of an energy shortage and furthermore it is desirable, insofar as possible, that all utilities with similar operating and service characteristics should have similar emergency procedures.

IT IS THEREFORE ORDERED that within twenty (20) days from the date of this order that East Kentucky Power Cooperative and Big Rivers Electric Corporation shall submit their plan of emergency procedures to be followed during any shortage of energy for the generation of electric power. In the preparation of the emergency procedures submitted, the utility shall consider the appropriateness of the use of the procedures and substance contained in Attachment No. 1, which is a part of this Order.

Done at Frankfort, Kentucky this 28th day of January, 1981.

ENERGY REGULATORY COMMISSION

Chairman

Vice Chairman

Commissioner

ATTEST:

Secretary

ATTACHMENT NO. 1

TO AN ORDER OF THE ENERGY REGULATORY COMMISSION

IN ADM. CASE NO. 238 DATED: JANUARY 26, 1981

ENERGY EMERGENCY CONTROL PROGRAM

Purpose -- To provide a plan for reducing the consumption of electric energy on the Company (Company) system in the event of a severe coal shortage, such as might result from a general strike in the coal mines.

Procedures -- In the event of a potential severe coal shortage, such as one resulting from a general coal strike, the Utility shall make an inventory of their fuel stock to determine the quantity and quality of the recoverable fuel. This inventory shall be completed within the thirty (30) day period prior to the anticipated start of the emergency and the following steps will be implemented. These steps will be carried out to the extent not prohibited by contractual commitments or by order of the regulatory authorities having jurisdiction. The "days' operation" referred to below will be calculated in accordance with Appendix A, which is a part of this Attachment.

I. To be initiated when fuel supplies are decreased to 50 days' operation of coal-fired generation and a continued downward trend in coal stocks is anticipated:

1) Advise all wholesale customers of the number of days burn remaining.

2) Optimize the use of non-coal-fired generation to the extent possible.

3) For individual plants significantly under 50 days' supply, modify economic dispatching procedures to conserve coal.

4) Discontinue economy sales to neighboring utilities.

5) Curtail the use of energy in all company offices, plants, etc.

II. To be initiated when fuel supplies are decreased to 40 days' operation of coal-fired generation and a continued downward trend in coal stocks is anticipated:

1) Advise all wholesale customers of the number of days burn remaining.

2) At coal-fired generating plants, substitute the use of oil for coal as permitted by plant design, oil storage facilities and oil availability.

3) Discontinue all short-term sales to neighboring utilities.

4) Limit emergency deliveries to neighboring utilities to situations where regular customers of such utilities would otherwise be dropped or where the receiving utility agrees to return like quantities of energy within 14 days.

5) Purchase energy from neighboring systems to the extent practicable.

6) Purchase energy from industrial customers with generation facilities to the extent practicable.

7) Through use of the news media and direct customer contact, appeal to all customers to voluntarily reduce their use of electric energy as much as possible, and in any case endeavor to reduce the nonessential usage of electricity.

III. To be initiated -- in the order indicated below -- when fuel supplies are decreased to 30 day's operation of coal-fired plants and continued downward trend in coal stocks is anticipated:

1) Advise all wholesale customers of the number of days burn remaining.

2) Discontinue emergency deliveries to neighboring utilities unless the receiving utility agrees to return like quantities of energy within 7 days.

IV. To be initiated when fuel supplies are decreased to 20 days' operation of coal-fired generation and a continued downward trend in coal stocks in anticipated:

1) Advise all wholesale customers of the number of days burn remaining.

2) The Company shall advise all customers of the mandatory program specified in Section V below.

V. To be initiated as a measure of last resort when fuel supplies are decreased to 15 days' operation of coal-fired generation and a continued downward trend in coal stocks is anticipated:

1) Advise all wholesale customers of the number of days burn remaining.

2) As a last resort, implement load shedding procedures as required to preserve the integrity of the electrical system. This procedure shall be coordinated with the wholesale customers in order to assure the mininum impact upon those services which are necessary for the protection of Human Life and Safety and for the protection of Physical Plant Facilities

Termination of Energy Emergency -- The Energy Emergency Control Program shall be terminated upon notice to the Commission, when (a) the remaining days of operation of coal-fired generation is at least 20 days, (b) coal deliveries have been resumed, and (c) there is reasonable assurance that the coal stocks are being restored to adequate levels.

APPENDIX "A"

METHOD FOR CALCULATING "DAYS' BURN" REMAINING FOR COAL-FIRED GENERATION

The procedure described herein will be used to project the day's coal supply remaining for a system or group of systems and to determine the dispatch required to obtain the maximum days' burn from that supply.

Data Required

1. All long-time unit deratings and partial outages
2. The weighted average net heat rate (BTU/KWH) of the units within each plant (weighted by unit capability)
3. The recoverable inventory of coal in storage at each plant (TONS)
4. The heat value (BTU/lb) of the coal in storage at each plant
5. The system's projected average daily coal-fired generation requirements for the coming 60 days (MWH/DAY)
6. Additional output obtainable at each plant by the firing of supplemental fuel; i.e., oil, natural gas, propane

Algorithm Used

1. A burn factor (TON/MWH) is calculated for each plant based on the weighted average heat rate of the plant and the heat value of the coal in storage.

$$\text{TON/MWH} = \frac{\text{BTU/KWH} \times 1000\ \text{KWH/MWH}}{\text{BTU/lb} \times 2000\ \text{LB/TON}}$$

2. The maximum 24 hour MWH output of each plant is calculated considering long term deratings and partial outages.

$$\text{MAX MWH/DAY} = (\text{PLANT CAP-DERATE}) \times 24$$

3. The MWH/DAY output obtainable from the coal in storage at each plant is calculated for 10 days, 15 days, and so on to 75 days. If supplemental fuel output is available, it is to be included.

$$\text{MWH/DAY} = \frac{\text{TONS IN STORAGE}}{(\text{TONS/MWH}) \times \text{DAYS}} + \text{SUPP. MWH/DAY}$$

4. After each calculation of MWH/DAY is made, the value is compared to the MAX MWH/DAY. If the value calculated is greater, the MWH/DAY for that number of days is set equal to the MAX MWH/DAY.
5. The MWH/DAY obtainable for 10 days from each of the systems's plants is summed, then from each of the plants for 15 days, 20 days, and so on. The value of each summation is the MWH/DAY output of the system's coal-fired generation obtainable for that number of days.
6. The system's projected daily average coal-fired generation requirement in MWH/DAY is obtained by estimating the system's total MWH internal load requirement, minus firm purchase, plus firm sales, minus generation from non-critical fueled units and dividing the value obtained by the number of days over which the estimate was made.

$$\text{MWH/DAY} = \frac{\text{LOAD} + \text{SALES} - \text{PURCHASE} - \text{NON-CRITICAL FUEL}}{\text{DAYS}}$$

7. The MWH/DAY generation requirement determined in Step 6 is then compared to the total system MWH/DAY obtainable for specified days as determined in Step 5. The days remaining coal supply are the days at which the MWH/DAY generation requirement equals the MWH/DAY obtainable. If the indicated days remaining supply differs significantly from the number of days used to obtain the average MWH/DAY in Step 6, Step 6 should be repeated.

To realize the days remaining coal supply determined in Step 7, a system's generating plants must be dispatched such that each plant's daily net energy output (MWH/DAY) when averaged over a calendar week approximately equals the MWH/DAY obtainable from that plant for the number of days determined to be the system's days coal supply. How such a dispatch is affected is best determined by each system.

Jointly owned plants will be treated on a pro rata basis. Each participant will report his share of the plant's total capacity and fuel supply as if it were at a separate location. The average MWH/DAY output requirement and days remaining coal supply of each participant's share will be determined separately.

Example:

As an example, consider a 1400 MW installed capacity hypothetical system. The system's projected average internal energy requirements are 26,400 MWH/DAY. External firm sales obligations are 1,200 MWH/DAY. The system has four generating plants, one of which is a 500 MW nuclear capable of sustained operation of 90 per cent capacity factor. The three coal plants have the capability rating, coal inventory, and heat rate shown below. No condition deratings are considered. The coal in storage at all three plants is assumed to have a heat value of 11,000 BTU/lb.

COAL FIRED PLANTS

Plant	MW Net Capability	Max MWH/DAY	Tons in Storage	Heat Rate BTU/KWH	TON/MWH
1	500	12,000	200,000	9,500	.4318
2	300	7,200	75,000	10,000	.4545
3	100	2,400	30,000	10,500	.4773

From the above data, the MWH/DAY output of each plant is calculated for 5-day increments of days fuel supply remaining and totaled for the system.

MWH/DAY FOR DAYS REMAINING

Plant	25	30	35	40	45	50
1	12,000	12,000	12,000	11,579	10,292	9,2[illegible]
2	6,600	5,500	4,714	4,125	3,667	3,3[illegible]
3	2,400	2,095	1,796	1,571	1,397	1,2[illegible]
TOTAL	21,000	19,595	18,510	17,275	15,356	13,8[illegible]

The energy requirement on the coal-fired plants is:

System internal energy requirement	26,400 MWH/DAY
Firm sale obligation	1,200 MWH/DAY
Nuclear unit output (500 x 24 x .9)	-10,800 MWH/DAY
Coal-fired output required	16,800 MWH/DAY

The coal-fired energy requirement lies between 17,275 MWH/DAY for 40 days and 15,356 MWH/DAY for 45 days. By interpolation the value for 16,800 MWH/DAY is found to be 41 days. To satisfy the loading criteria each plant's average daily output should be:

Plant 1	11,250 MWH/DAY	- 93% CAPACITY FACTOR
Plant 2	4,025 MWH/DAY	- 56% CAPACITY FACTOR
Plant 3	1,525 MWH/DAY	- 64% CAPACITY FACTOR